AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1.   (Currently amended) A computer program product, tangibly embodied on a machine-readable storage device, the computer program product comprising instructions operable to cause data processing apparatus to perform operations comprising:

displaying a user interface in a client program, the user interface having a plurality of controls, the plurality of controls including multiple types of controls, each control having a state and a control data structure, wherein the state of the control includes a data state and a view state;

for each control in the plurality of controls, storing the state of the control as a first state for the control in the control data structure;

receiving user input comprising a change to the state of a control in the plurality of controls;

updating the state of the control based on the user input;

storing the updated state of the control as a second state for the control in the control data structure;

receiving user input comprising a request to undo the change;

determining whether the change affects the data state of the control;

determining whether the change affects the view state of the

control; ~~and~~

restoring the state of the control to reflect the first state for the control;

<u>transmitting the restored state of the control to a server; and</u>

<u>clearing the stored first state for the control and the stored second state for the</u>

<u>control from the control data structure</u>.

2.   (Previously Presented) The computer program product of claim 1,

wherein the multiple types of controls include one or more of a text field control type, a

radio button control type, a table control type, a tray control type, and a menu control

type.

3.   (Previously Presented) The computer program product of claim 1,

wherein the operations further comprise:

restoring the state of the control only if the change affects the data state of the

control.

4.   (Previously Presented) The computer program product of claim 1,

wherein the operations further comprise:

receiving user input comprising a request to redo the change to the control; and

restoring the state of the control to reflect the second state for the control.

5.   (Previously Presented) The computer program product of claim 1, wherein the user input comprising the request to undo the change is received while focus is not on the control.

6.   (Previously Presented) The computer program product of claim 1, wherein restoring the state of the control includes restoring a state of another control that shares data with the control.

7-8.   (Canceled).

9.   (Currently amended) A computer program product, tangibly embodied on a machine-readable storage device, the computer program product comprising instructions operable to cause data processing apparatus to perform operations comprising:

generating a plurality of data structures that store application data and associations between the application data and a plurality of application controls, wherein each application control of the plurality of application controls has a state and a control data structure, wherein the state of each application control of the plurality of application controls includes a data state and a view state, and wherein each application control of the plurality of application controls is rendered based on the application data;

detecting that at least one application control of the plurality of application controls has changed from a prior state to a new state;

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determining whether the change affects the data state of the at least one

application control;

determining whether the change affects the view state of the at least one

application control;

recording the prior state of the at least one application control;

updating at least one data structure of the plurality of data structures based on

the new state;

receiving user input requesting that an undo operation be performed;

performing the undo operation by restoring the at least one application control

to the prior state; and

updating the at least one data structure of the plurality of data structures based

on the prior state;

transmitting the restored state of the control to a server; and

clearing the stored data in the at least one data structure of the plurality of

data structures.

10.   (Previously Presented) The computer program product of claim 9,

wherein the at least one data structure of the plurality of data structures is at least

one data tree.

11.   (Previously Presented) The computer program product of claim 9,

wherein the at least one data structure of the plurality of data structures is stored on a

client device.

12.   (Previously Presented) The computer program product of claim 9,
wherein the plurality of application controls include multiple types of controls.

13.   (Previously Presented) The computer program product of claim 9,
wherein the associations between the application data and the plurality of application
controls are defined by metadata.

14.   (Currently amended) An apparatus comprising:

means for displaying a user interface in a client program, the user interface
having a plurality of controls, the plurality of controls including multiple types of controls,
each control having a state and a control data structure, wherein the state of the control
includes a data state and a view state;

means for, for each control in the plurality of controls, storing the state of the
control as a first state for the control in the control data structure;

means for receiving user input comprising a change to the state of a control in
the plurality of controls;

means for updating the state of the control based on the user input;

means for storing the updated state of the control as a second state for the
control in the control data structure;

means for receiving user input comprising a request to undo the change;

means for determining whether the change affects the data state of the control;

means for determining whether the change affects the view state of the
control; and

means for restoring the state of the control to reflect the first state for the control;

means for transmitting the restored state of the control to a server; and

means for clearing the stored first state for the control and the stored second state for the control from the control data structure.